

CLAIMS

1. A plant for producing a metal band coated with at least one protection layer comprising means for controlling the running of the band M, successively,  
 5 through a series of treatment sections, placed one after the other in a continuous line, and comprising at least, in one running direction of the band:

- a supply section A,

- a first metal-type coating section B with two lateral sides perpendicular to a longitudinal running direction of the band M, respectively a first side B1 and  
 10 a second side B2, and comprising a means (21a) for feeding the band into the said metal coating section B, located at a low level of the first side B1 thereof and ending in a tub (40) liable to be filled with a liquid metal bath, means (22b, 23b) for guiding the band along a first running path (4) comprising an immersion section penetrating into the tub (40) for depositing metal on the band M, a rising  
 15 section (41) extending along a more or less vertical direction between the exit from the tub (40) and a high level (22b, 22'b) and a falling section (43) extending between the said high level and an exit means (23b) from the said first coating section B, located at a low level on the second side B2 thereof, cooling means (44) being arranged at least along the rising section (41) of the  
 20 said first running path (4) for solidification of the metal deposited on the band M,

- a second application-type coating section C, located beside the first section B and having two sides spaced apart perpendicular to the running direction, respectively a first side C1 extending along the second side B2 of the metal coating section B and a second side C2, whereas the said coating section  
 25 C comprises means (61, 63) for coating the band M that are placed at a low level of the said first side C1, means (25c, 26c, 27c) for guiding the band along a second running path (6) passing in front of the said coating means (61, 63) and comprising at least one rising section extending vertically between the low level of the said coating means (63) and a high level (26c, 27c), along which are  
 30 placed means for drying the coating after application, and an exit means (28c) from the coating section C, placed on the second side C2 thereof,

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- an exit section D comprising at least one band accumulator (7) and winding means (50).

2. A plant according to claim 1, characterised in that it comprises a complementary treatment section (5) placed on the path of the band M between the exit (23b) of the first metal coating section B and the inlet (21c) in the second application-coating section C.

3. A plant according to claim 2, characterised in that the complementary treatment section (5) comprises a 'skin-pass' mill (51) placed between two tensioners (54a, 54b).

4. A plant according to claim 3, characterised in that the complementary treatment section comprises a planer under load (52) placed between two tensioners (54a, 54b).

5. A plant according to one of the claims 2 to 4, characterised in that the complementary treatment section (5) comprises an additional coating device (53) such a chromating or phosphating device.

6. A plant according to one of the claims 1 to 5, characterised in that the means (21c) for entering the second application-type coating section C is placed on the second side C2 thereof, opposite to the first coating section B and that, between the exit means (24b) of the first coating section B and the inlet means (21c) into the second coating section C, the band follows a bent linking path comprising at least a first horizontal branch (47) passing, at low level, beneath the second coating section C, means (21d, 21'd) for turning over and second horizontal branch (55) returning, at middle level, to the inlet means (21c) into the second coating section C.

7. A plant according to claim 6, characterised in that it comprises a complementary treatment section (5) placed in the extension of the first branch (47) of the linking path and that the second branch (55) returning to the inlet (21c) in the second coating section C passes above the said complementary treatment section (5).

8. A plant according to claim 7, characterised in the exit section (D) comprises an exit accumulator (7) of horizontal type and that the complementary treatment section (5) and the branch (55) returning to the

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second coating section C are placed beneath at least one rear portion of the exit accumulator (7).

9. A plant according to one of the previous claims, characterised in that the running path (6) in the application-type coating section C is folded into two nested columns comprising successively, from a low level (22c) of the coating section C, a first rising path comprising coating (61) and drying (62) means, a means (23c) for turning over, a falling path to a means (25c) for turning over, a second rising path comprising coating (63) and drying (64) means and a path (65) returning to the front to an exit means (28c) from the application-type coating section C, placed on the second side C2 thereof, above the inlet means (21c).

10. A plant according to one of the previous claims, characterised in that the exit section (D) comprises successively, in the running direction of the band M, an exit accumulator (7) of horizontal type, means (76, 76') for turning over and winding means (50) placed beneath a front portion of the exit accumulator (7).

11. A plant according to claim 10, characterised in that it comprises means (77) for inspecting the band that are placed between two rolls (76, 76') for turning over to the rear of the band and that the exit accumulator (7) is sized to enable band stoppages for inspection purposes.

12. A plant according to one of the previous claims, characterised in that it comprises means for putting into service selectively pieces of equipment in each treatment section thereby enabling to choose an operating mode suited to the needs among a set of combination possibilities of the said pieces of equipment.

13. A plant according to claim 11, characterised in that the means for putting into service, selectively, pieces of equipment in each treatment section enable to choose an operating mode suited to the needs among a set of possibilities comprising at least a first mode with metal coating only, a second mode with metal coating and complementary treatment, a third mode with complementary treatment and application-type coating, a fourth mode with two combined coatings, respectively metal and application, and a fifth mode with

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application-type coating only, whereas each operating mode may comprise a complementary treatment with at least one 'skin-pass'.

14. A plant according to one of the previous claims, characterised in that the exit accumulator (7) is of the type comprising a plurality of parallel belts travelling back and forth along paths predetermined by a set (71) of fixed rolls and a set (72) of mobile rolls placed on a looping-in carriage that can move between two positions, respectively a minimum accumulation retracted (72a) position and a maximum accumulation extended (72b) position, and intermediate sets (74) of separating arms spaced apart and distributed over the length of the accumulator in order to come between the parallel belts of the band, whereas each set (74) of separating arms is connected to means for controlling respectively the engagement or the disengagement of the said arms, as the looping-in carriage moves respectively in the increasing direction or in the reduction direction of the accumulated length.

15. A plant according to claim 14, characterised in that a rear portion (7a) of the exit accumulator (7), comprised between a middle position (72c) of the looping-in carriage and the retracted position (72a) of minimum accumulation, does not contain any separating arms and in that tensioners (75, 75') are placed, respectively upstream and downstream the exit accumulator (7) in order to maintain on the band M sufficient traction to prevent any contact between the belts, on the rear portion (7a) of the accumulator (7) deprived of separating arms.

16. A plant according to one of the previous claims, characterised in that the band is brought to a temperature at least equal to that of the liquid metal contained in the bath (40).

17. A plant according to claim 16, characterised in that the supply section A comprises means (11, 11') for unwinding reels, an inlet accumulator (3) and means (32, 33) for pre-heating the band.

18. A plant according to claim 17, characterised in that the means for pre-heating the band comprise an annealing furnace (32) and means (33) for cooling the band M up to a temperature compatible with the metal coating.

19. A plant for producing a coated band according to one of the previous claims, characterised in that it is placed in a single building (18) comprising a central tower (80) with two abutting sections in which are provided respectively both coating sections, respectively, the metal-type B and the application-type C coating sections, as well as two halls (81, 81') of smaller height that extend  
5 respectively on either side of the said central tower (80) and in which are installed, respectively, the exit section D and the supply section A.

20. A plant according to claim 19, characterised in that the exit section D is placed in a hall (81) whose height and length correspond at least to the height  
10 and to the length of the exit accumulator (7).

21. A plant according to claim 20, characterised in that the lateral hall (81) in which is placed the exit section D exhibits a height determined in order to cover the exit accumulator (7) while leaving beneath the said accumulator a space of sufficient height to contain, on the one hand a complementary  
15 treatment section (5) of the band extending beneath a rear portion of the accumulator (7) and, on the other hand, at least means (50) for winding the band extending beneath a front portion of the accumulator (7), whereas the length of the said hall (81) is determined in order to leave, ahead of the accumulator (7), sufficient room to place therein means (76, 76') for turning the  
20 band M over.

22. A plant according to claim 20, characterised in that the supply section A is placed in a second hall (81') whose height and length correspond at least to the height and to the length of an inlet accumulator (3).

23. A plant according to claim 22, characterised in that the second hall  
25 (81') in which is placed the supply section A exhibits a height determined in order to cover the assembly composed of an inlet accumulator (3) and of means (32, 33) for pre-heating the band.